The Xanadu® Project Moves Into the Netscape* Era

OPEN TRANSMEDIA: Radical Design for a New Literature

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LEGACY OF THE XANADU PROJECT.

Last month, in Boston, I spoke at the symposium commemorating "As We May Think," Vannevar Bush's prescient 1945 article about personal information machines of the future. When I had finished, Doug Engelbart-- a friend of mine since 1967-- came to the audience microphone and asked, "How come I never heard this before?" I could only reply, "I thought you did."

We thought everyone heard much more than they did. The problem was that there was so much to say that our hearers got overloaded. Our vision was a tightly-knit design of which hypermedia and world-wide publishing were just the beginning.

The Project Xanadu that I and colleagues have pursued for thirty-five years has been not just a scheme for global on-line publishing of point-linked objects (like the Web), but a rather more profound design for a universal electronic literature-- in the sense of a universe of connected media worthy of the human heritage and the great interactive opportunity.

The design we have been trying to achieve was not understood by most people, because there was so much to say that went beyond what they were ready to hear. Our explanations of what we were endeavoring to do have been called "boasting," rather than being understood as the specifications for an electronic medium that goes beyond the mere spaghetti hypertext that has been achieved so far.

What we have been trying to achieve is still needed. As follows.

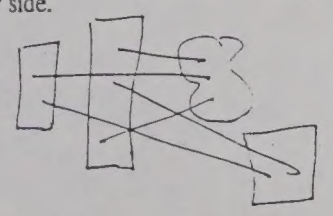
XANADU'S OBJECTIVES FROM THE BEGINNING.

Two of our objectives everyone knows:

- we believed from 1960 to 1974, despite ridicule, that there was an enormous latent demand for personal computers. Proven.
- From 1960 we predicted (despite ridicule) a vast demand for personal hypermedia publishing on world-wide networks. Also proven, lately.

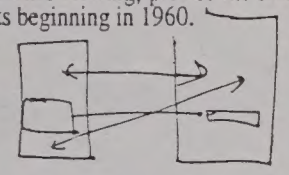
But the rest nobody has yet. The world needs:

1. TRANSPARALLEL VIEWING AND MEDIA: connected objects that may be dynamically compared side by side.



For instance, comments next to an original document, versions (successive and alternative), an illustration and its captions (text linked to graphics), etc. (*Parallel* viewing and media would be simply side-by-side; *transparallel* means you may see explicit connections between individual parts of side-by-side entities.)

Transpointing windows are a key type of transparallel viewing, part of the Xanadu idea from its beginning in 1960.



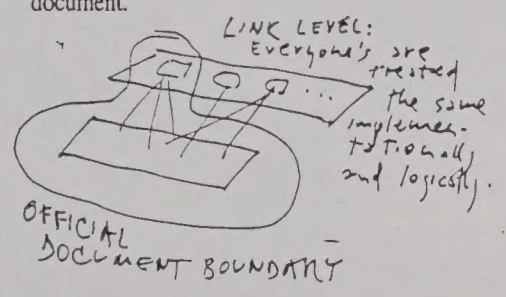
Note that side-by-side columns and windows are of course only one visualization. (I believe that in 1972 I asked the guys at Xerox PARC when they were going to have arrows that crossed window boundaries dynamically. "Oh, we'll get to it," I think they said. They haven't yet, and everyone is stuck with what they did then-- considered holy by many people.)

2. FREE QUOTATION THAT DOESN'T BREAK COPYRIGHT. We posited a copyright system where anyone would be free to quote virtually, so that the recipient got the material from the original (or an equivalent instance). See "Transcopyright," further on.

3. INTERCOMPARING THESE QUOTATIONS SIDE-BY-SIDE. It is vital to be able to see the original context of a quotation from every instance. It is also desirable to be able to see all the published instances from a given instance. (How much you can follow among these instances is the parameter of *transvisibility*.)

3. EQUALITY OF USER LINKS. In many systems and electronic publications, users are "allowed to make links"– but only inferior links, not as general or at the same level as author's links.

We believe that the user's links must be at the same level, and in the same form of implementation, as the author's-- though they are of course outside the boundary of the author's integral document.



Taken all together, these desiderata mean:

OPEN TRANSMEDIA.

So the punch line is: Xanadu was always intended **to allow you to re-use and republish anything, always being able to see the same material in side-by-side connected (transparallel) presentation.** This is not a demented misunderstanding of how computers work, as alleged by some, but a principled design which can be achieved in more than one way.

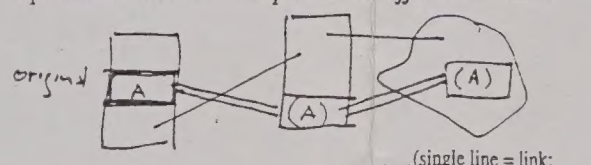
The overall literary design is therefore what I now call OPEN TRANSMEDIA– *a network hypermedia publishing system with unrestricted re-use and re-publication* (under an appropriate copyright doctrine, see below) and *transparallel viewing*. That means anyone may re-use and re-publish the same thing in more than one context, and compare those contexts side-by- side. This cleans up the problems of--

- **intercomparison** (obviously);
- **out-of-context re-use** (the original context of any quote may be seen next to it);
- **"lost in hyperspace,"** since you may move any materials into enclosing and clarifying new contexts;
- **copyright and royalty** (anything may be virtually re-used and republished, if the republication is *virtual*-- a pointer giving the network address of the original material)-- and the material is bought from the original publisher by each user. (See "Transcopyright," further on.)

TRANSCLUSION.

The quark of all this we now call "transclusion," for it makes possible everything else.

Transclusion means (originally) virtual inclusion of material across a document boundary. But this turns out to be equivalent to ***instances comparable in different contexts.***



(single line = link; double line = transclusion)

Thus, at the technical level, transclusions are those connections which establish equivalence among instances of the same material.

Transclusions are not links, but the complement of links. Links are connections among things which are *different*; transclusions are connections among things which are *the same*. Link and transclusion complement each other like right and left hand.

TWO CHEERS FOR THE WEB; WHAT REMAINS TO BE DONE

Sure, the World Wide Web is a gas. But it's spaghetti hypermedia-- just as disorienting as the "spaghetti programming" that Dijkstra railed against twenty years ago. The Web consists of long scrolls with diving-boards into darkness; it isn't stable publishing, but a labyrinth of ever-changing shop-windows, a froth of ever-popping bubbles.

On the Web You may jump to other people's material, but you mayn't re-use it in your own Web pages, let alone intercompare such re-uses. We need Xanadu publishing methods-- now called Open Transmedia, above-- more than ever.

THE PREVIOUS XANADU: A SERVER STRATEGY.

The Xanadu project that Autodesk sponsored (from 1988 to 1993) was a server-based strategy: we planned a server system that would store and forward materials published by users on the various network nodes, all under a common copyright arrangement that allowed on-line sharing. (See my book *Literary Machines* (Mindful Press, Sausalito CA). That software, the XOC server, is still under development.†

Note that the XOC server represents a server-based strategy, with one special legal problem: companies that ran the network might be held legally responsible, at some level, for the contents.

THE NEW XANADU: A CLIENT STRATEGY.

Given today's Internet environment, as defined by Netscape Navigator,* it is important to explore other strategies. The new component Xanadu is defined to work within this new world.

TRANSCOPYRIGHT.

Always implicit in the Xanadu project was a permission arrangement for all consenting publishers. In order to follow transclusions into arbitrary new contexts, the publishers (--who might also be the authors; we always believed in self-publishing--) would have to give permission for this ahead of time.

This has now been formalized, with legal help‡, as the doctrine of "transcopyright"-- a word intended as shorthand for this class of permissions, in much the same way that "shareware" is a shorthand for a class of permissions. (T. Nelson, "Transcopyright: Pre-Permission for Virtual Republication." Available by e-mail on request.)

This also means a different URL format, probably outside the http protocol, e.g.

xu://docname/span/deal-address/clickable-data

where "xu" means "treat this specially as transcopyrighted material," "name" is a persistent name for the object and its version, "span" tells what portion, and "deal-address" tells where to find the details of the particular transcopyright permission. (Note that these details need not be sent for if already recognized to be in the user's storage.) "Clickable-data," of course, is whatever the user might see and click on.

WHY TRANSCOPYRIGHT?

Not everyone sees why this is necessary. Here's a good example: it is currently almost impossible to write books of film criticism, because of the difficulty of obtaining permission to print still pictures from films. If the films were available by transcopyright, it would be easy-- *and small publishers and producers will relish this way of publicizing their work, and improving access to it.*

MICROSERVERS.

To use transcopyright without royalty, one may only need a server which responds to an anonymous request for a specific part of a document.

Royalty transcopyright, however, also requires a micro-financial transaction (for example, we recommend that publishers set royalties in the range of 100 to 1000 nanobucks per text character or 100,000 to 1000 nanobucks per video frame; these are comparable to current prices of novels and videos).

THE DEEP CLIENT.

Users need a way to keep track of pieces they have bought. The Deep Client, always implicitly required by the XOC server, must keep track of the pieces, their receipts and contracts, and continuation addresses (to get more of favored materials).

TRANSVISIBILITY.

The Xanadu group put an enormous effort into issues of Transvisibility-- how to see from one transclusion to another, ad infinitum-- and ways to manage it on sequential processors. This may be no longer necessary; parallel processors can make it much easier, and transvisibility initiatives are underway by the Foresight Institute and John Walker.

Thanks to Prof. Yuzuru Tanaka for use and generalization of his term "transmedia."

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† ***STATE OF THE XOC XANADU SERVER.*** The server software sponsored by Autodesk is under continuing development at XOC, Inc., under the direction of Roger Gregory. Having gathered together its code, left in a somewhat scattered state after the Autodesk settlement, he is now tking steps to put it on the Web for interactive experimentation by users.

‡ Special thanks to Robert W. Fiddler, Esq., of Great Neck, NY.

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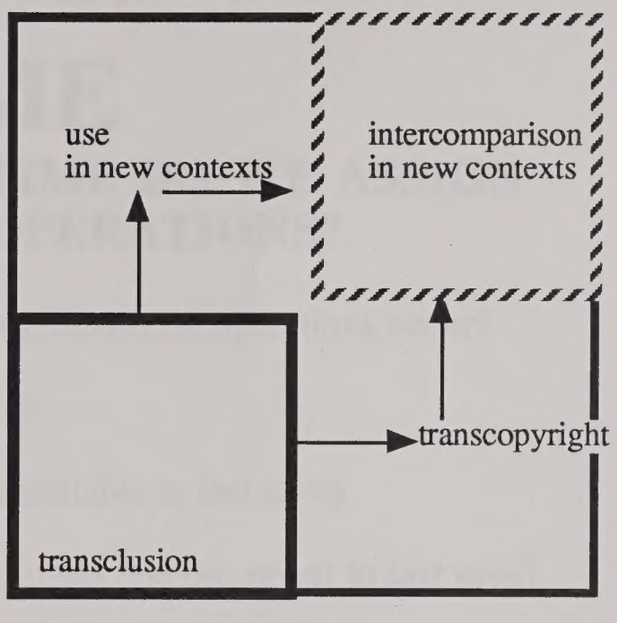

ZIP TIME

-- TO WHAT TIME DO WE ASSIGN PROJECTED OPERATIONS?

In what time do zip combinatorial operations occur?

Different forms of time:

UNDO time (cancellable to last save)

Macintosh time (undo one op; revert to last save)

Hypertime (all previous states reinstatable)

Time & Choices for Zip Editor:

Takes place in "flat future"

Takes place in present

Retention choices for Projections

Don't Save

Save record and method for re-doing

Retain, keep "Unreal"

PROJECTED OPERATIONS:
-- TO WHAT TIME DO WE ASSIGN
ZIP TIME